



*Gas Analysers & Integrated Systems  
for Process Gas Analysis*

Control Unit

M701



### Features

- Powerful microprocessor based control unit
- Direct inlet from every type of Zirconia sensor
- Reading of temperature, mV, O<sub>2</sub>
- Alarm status indication (engineering units)
- 2 programmable alarms
- Isolated 4-20 mA output (optional RS 232 C)
- Probe impedance test
- Automatic printing in alarm and programmable periodical printing
- Field selectable ranges
- Internal inner coil joint
- Versions for safe area or in Explosion-Proof housing for hazardous area Zone 1 / Zone 21

# M701 Control Unit

## Description

The M701 model is a smart instrument which elaborates the signals coming from the Zirconia probes, providing for the computing and displaying of the Oxygen value in % or parts per million following the Nernst's law.

The instrument has been designed to re-transmit the 4-20 mA signal according to the set range and may be connected to a PC or an external printer in order to have a chronological tabulation of both measures and alarms.

When probe is process heated, O<sub>2</sub> % is transmitted above 600°C. In case of malfunction, the instrument will automatically provide for the supervision of the probe.

Optional RS232C output can directly drive a printer with selectable timing and baud rate. Isolated current output is standard.

## Mounting

The unit can be housed in a compact Noryl DIN case for panel mounting (standard), in a IP 65 case with clear front door for wall mounting or in explosion proof housing for mounting in classified area.

## Single or dual alarm

A single alarm (high or low) or dual alarms (1 high and 1 low, 2 high or 2 low) can be provided as option. Each alarm consists of: 1) a keyboard configurable alarm threshold; 2) a LED, which is lit when an alarm is detected; 3) a relay contact that can be used to actuate an external signal or to start a shutdown process device.

## Display

It provides a continuous readout indication of the requested variable in engineering units (e.g. %), of alarms set point and alarms condition.

## Control unit main elements

- 4 digits display for %O<sub>2</sub> or other variables visualization.
- Two Led for alarms status indication.
- One led for instrument programming status indication.
- Two increase—decrease push buttons.
- One F key for display selection.
- One A key to enter into programming.

## Conformity to European Normative

In accordance to Low Voltage directive 2006/95/EC

In accordance to EMC directive 2004/108/EC:

- EN 61000-6-2
- EN 61000-6-3
- EN 50270

In accordance to directive ATEX 94/9/EC

# Technical Specifications

## Inputs

Input signals: 1 for self-heated probe, 2 for process-heated probe; 3 for process-heated probe and auxiliary external thermocouple (same type).

Scanning time: 0,6 seconds

Conversion type: double ramp

Resolution: 1/20000

Response time: 1 second typical

Input's impedance: 100 Mohm typical

Isolation between channels: none

## Alarms

Contact rating: N.O./N.C. 1 A @ 250 Vac (define the alarm contact condition -soldering type- at order)

Set: programmable on 100% of range

Relay status: normally triggered / not triggered

Number of alarms: 2 on concentration, 1 on temperature t1, 1 on temperature t2

Hysteresis: 5 / 1 / .5 / .1% of range

Delay: 10 / 5 / 1 / .1 seconds

Alarm scanning: ON/OFF programmable

Threshold: high or low to be selected at order; field adjustable by soldering jumpers.

## Serial interface

Standard: RS 232 C

Check lines: CTS

Speed: 9600, 4800, 2400, 1200, 600, 300 baud/sec.

Parity: even, odd, none

Isolation: 1500 V

## Power Supply:

220/110 Vac; 50/60 Hz; 5 VA

## Diagnostics

TC out of order: err1 message on display

Broken C.J: err2 message on display

Anomalous conditions: OFL message on display

## Analogical output

Output: 4-20 mA isolated proportional to 100% of range on maximum load of 500 Ω

Total Range (over range): 3.6 - 24 mA

Resolution: 1/3800

Isolation: 1500 V

Uploading time: 1 second

## Temperature ranges (only for model 6801)

TC type K, R, S, B (keyboard selectable)

°C ranges

Tc K from 0 to 1370 °C

Tc R from 0 to 1700 °C

Tc S from 0 to 1760 °C

Tc B from 200 to 1820 °C

°F ranges

Tc K from 32 to 2498 °F

Tc R from 32 to 3092 °F

Tc S from 32 to 3200 °F

Tc R from 392 to 3300 °F

## Printing messages

Periodical printing: programmable in hours, min.

Alarm printing: automatic printing

Printing message: year, month, day, hours, minutes,

% O<sub>2</sub>, temperature, alarm 1 status, alarm 2 status

## Probe resistance

Range: from 0 to 99.9 Kohm

Reading: from keyboard in off-line conditions

## Ambient requirements

Working temperature: 0 ÷ 50 °C

Storage temperature: -10 ÷ +75°C

Humidity: 10 ÷ 90% without condense

## Physical specification

Dimensions: 96 x 96 x 185 mm.

Weight: about 0,5 Kg.

Mounting: panel cut out

## Clock

Clock type: Gregorian

Back-up: by means of lithium battery

Battery life: 1 year in case of power supply absence.

Accuracy: 1 second/month

## Explosion-proof housing

Protection mode:

II 2 GD EEx d IIC T6 IP65 T85°C T<sub>amb</sub> -20 ÷ +60°C  
for hazardous area ZONE 1 / ZONE 21

## Installation:

Wall or panel

Adjustable without opening the housing

3 Gk 3/4" holes



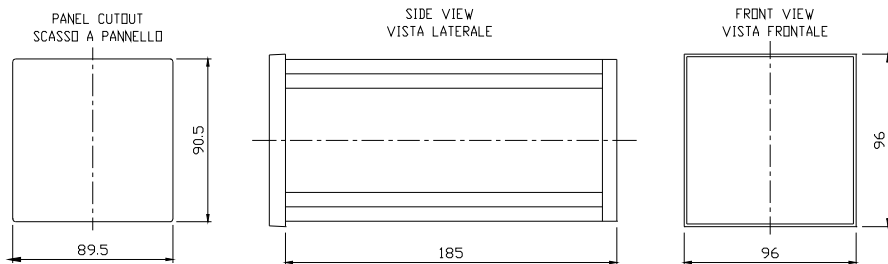
## IP65 housing

Installation:

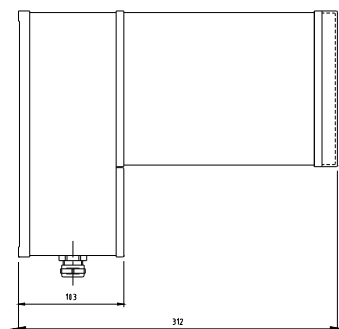
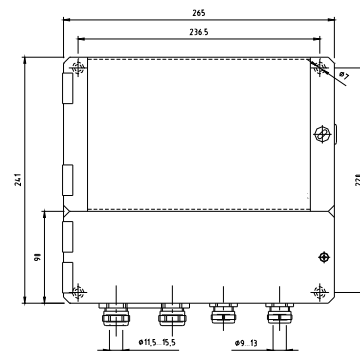
Wall or panel

Clear front door

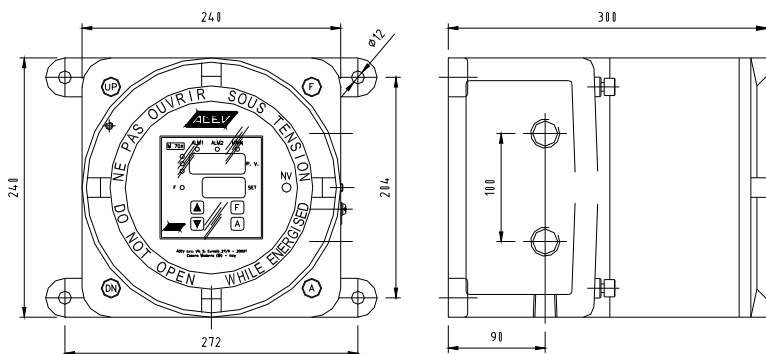
# Dimensional Specification



Control unit dimensions (provided loose)



IP65 housing dimensions



Explosion proof housing dimensions

## Ordering M701



### Suffix A - Line voltage

- 2 230 V 50/60 Hz
- 4 115 V 50/60 Hz

### Suffix B - Type of sensor combined with

- 1 High temperature probe model 6801
- 2 High temperature probe model 6801 + external TC
- 3 Fix temperature sensor (7873, M7873, 8864, 8870)
- 9 On specification

### Suffix C - Range

Menu A and B are alternative. As one full scale is selected at order, it will be possible to turn to another full scale (in filed) belonging to the same menu.

#### Menu A:

- 001 0-25 %
- 002 0-10 %
- 003 0-5 %
- 004 0-2 %
- 005 0-1 %
- 006 0-1000 ppm
- 007 0-100 ppm
- 008 0-50 % freely selectable

#### Menu B:

- 198 98-100 %
- 195 95-100 %
- 190 90-100 %
- 180 80-100 %
- 150 50-100 %
- 110 10-100 %
- 100 0-100 %
- 999 On specification

### Suffix D1 - Alarm threshold

- 0 None
- 1 1 low alarm
- 2 1 high alarm
- 3 1 high alarm + 1 low alarm
- 4 2 low alarms
- 5 2 high alarms
- 9 On specification

### Suffix D2 - TC alarms (only with suffix B = 2)

- 0 None
- 1 High alarm on internal TC + High alarm on external TC
- 2 Low alarm on internal TC + Low alarm on external TC
- 3 Low alarm on internal TC + High alarm on external TC
- 4 High alarm on internal TC + Low alarm on external TC
- 9 On specification

### Suffix E - Alarm contacts

- 0 None
- 1 Closed in alarm condition
- 2 Open in alarm condition

### Suffix F - Serial output

- 0 NO
- 1 RS 232 C + internal clock

### Suffix G - Control unit configuration

- 1 Provided loose for mounting in a cut out 89,5 x 90,5 mm
- 2 Mounted in IP65 housing
- 3 Mounted in EEx-d housing
- 9 On specification



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